Bulletin

SPECIAL ISSUE ON RESEARCH

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Bulletin

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Invest in the Future

One facet of Christmas Seal support for research deserves more attention than it has been getting. This is the extra boost given to the NTA-ATS program by tuberculosis associations all over the country. The total of $59,958 received last year made it possible to underwrite nine projects which would otherwise have been turned down for lack of funds. A list of contributors will be found on another page.

Association executives and boards of directors have already made it clear that they believe in supporting good research without regard for geography. North Dakota supported a project in North Carolina; Connecticut put its money into projects being conducted in New York and Chicago; Davidson County in Tennessee sent a check for a project in North Carolina; contributions from the State of Washington went to projects in Chicago and North Carolina; New Jersey funds supported projects in Colorado and North Carolina; a Maryland gift helped out on a Chicago project; Michigan sent a sizable sum for a Chicago project; several gifts from South Carolina were applied to a project in North Carolina; two counties in South Dakota helped support a Chicago study.

These gifts for out-of-state research projects have been growing over the years. Perhaps they might grow faster if associations were aware of the benefits they gain:

. . . The quality of research is safeguarded by the careful consideration given to all applications by a committee of experts chosen for their competence in many research fields.

. . . NTA takes care of all the administrative work and expense, including the meetings of the 18-member Committee on Research. The contributor encounters no "red tape."

. . . There is a wide range of projects from which to choose. The list of approved projects which appears in this issue is literally a "Buyer's Guide" for prospective purchases of research. An association may use its own judgment as to what kind of project it wishes to assist, with full assurance that its money will be spent to good advantage. Some projects have prospects for immediate practical applications; others are like "growth stocks" in that they are laying the groundwork for future advancements. An association may choose to help support a particular project or it may request that its money be used where most needed.

. . . There are no rules about the size of the contribution. Last year the range was from $5 to $17,095. Smaller contributions are just as important as large ones and are most welcome. If all 2,700 associations were to budget just $100 each for this purpose, the research program could be doubled in size.

The scientists who work on the various projects have been quick to show their appreciation of this assistance from tuberculosis associations. Many have traveled great distances and spent many hours meeting with associations to tell people what is being done and why it is so important. All of them have been extremely helpful with the preparation of materials for use in TB association publications and other media.

The extra push given to the research program by association contributions amounts to more than donations to some hard-working scientists. The money provides the stuff from which real progress comes.

Floyd M. Feldmann, M.D.,
Director of Research,
American Thoracic Society*

*The name of the American Trudeau Society has been changed to the American Thoracic Society.

NTA Research Funds— To the Proven Or the Promising?

Martin M. Cummings, M.D.

RESEARCH IN RESPIRATORY DISEASES and tuberculosis is the order of the day for the National Tuberculosis Association and the American Thoracic Society. The inclusion of respiratory diseases as part of the national program has broadened the interests of those who are currently engaged in research under NTA sponsorship. It also has attracted the interest of physicians and scientists in other fields who now wish to apply to NTA for research support.

This wholesome trend, however, poses certain practical problems which must be faced by our Society. First, it forces a reappraisal of the research currently being sponsored, which in large measure is being carried on by "proven" investigators. It is relatively easy for the Research Committee to continue to bet on winners. The odds always favor a tried and tested race horse. Doing this, however, leaves little or no uncommitted research funds for the "promising" new investigator who applies for research support. Secondly, like all other facets of the American economy, research has become more expensive. This means that the size of individual grants gradually increases because of increased costs for salaries, supplies, and equipment. Also, there is a larger number of trained investigators available to do research. With a relatively fixed income for research, the pressures become more acute each year.

Research Funds for Younger Scientists

From time to time it has been suggested that research support by the NTA be reduced for the distinguished scientist in order to make funds available for the man with a new idea. However, this is rarely brought about. Nevertheless, the proven researchers are the individuals whose reputations are such that they may now obtain research support from many other sources, particularly from government-sponsored research programs. Consequently, with much courage and understanding, a few of these individuals have already proposed reductions in the size of their research grants from the NTA in order to give the unproven investigator an opportunity to compete for the limited available funds.

Long Term Support

Another problem is that we do not as yet know the secret for spontaneous generation of research potential. Research developments are painfully slow. They evolve only after much contemplation, deliberation, and, finally, painstaking laboratory and clinical studies. In addition, the importance of the experience of research cannot be overlooked. A scientific method can be taught, but it sticks better with those who use it repetitively. Therefore, it seems important that research grants not only be available to initiate a study but also to sustain it throughout its complete growth and development.

In this regard our Society has an excellent record. The brilliantly conceived research of men such as Lurie,

Research developments are painfully slow. The importance of the experience of research cannot be overlooked.

One object of the NTA research program is to interest young scientists in the field of respiratory diseases.

Raffel, McDermott, Steenken, Youmans, Willis, and many others was translated into reality not only through the modest original research support which they received but also through the sustained support which was necessary to provide stability as well as continuity of research effort.

A Proposal

To some degree this must continue. It is proposed, therefore, that such proven investigators be awarded long-term grants in recognition of their distinguished accomplishments, but that the annual size of these grants be somewhat reduced. This proposal serves the dual purpose of recognizing those who are accomplished in research and at the same time retaining identification of the Society with these men of excellence. In no way should it imply a decreased respect for their ability to continue to perform outstanding work. On the contrary, an NTA long-term grant should be considered as an explicit reward for accomplishment. With this understanding, if grants to proven investigators were reduced, then the funds not expended would provide increased opportunities to the promising younger men who are applying for research support.

This concept is not original. In fact, several federal and voluntary health agencies have already made a distinction between research support for "career investigators" and competitive support for young men with ability and training who are knocking for opportunity.

New Social Research

Let us take a look at a new area of NTA-sponsored research social research. It is clear that the unity of research sponsored by the NTA has been greatly strengthened through the consolidation of social research with medical research. This concept of consolidation is fundamentally sound but, again, it poses practical problems. While it places both important elements within the same family, still, it makes them, in a sense, competitors for the same porridge bowl. The social aspects of medicine always have been and, in my judgment, will continue to be important factors in the study of disease. Man is both a biological and a social organism. He is influenced by environment as well as genetics. As increased knowledge is obtained, there is a tendency towards increased specialization, and this is followed by a scientific dissection of the individual. Such a dissection is undoubtedly necessary for a better understanding of the human mechanism, but is sometimes associated with a poorer understanding of the individual as a social being.

Role of Education

Here the role of medical education and its association with research becomes most important. Here also is where the distinction between scientific training and medical education should be made clear. A friend of mine once said, "You can train a monkey to ride a bicycle, but until he is educated he will not know where he is going."

Training in social or medical research must be accompanied by complete education in these fields. Research fellowships may serve this purpose admirably. But, again, funds for research fellowships are extremely limited in our Society. In truth, fellowship requirements compete for funds available for direct support of research. Perhaps it is time to consider a reapportionment of funds favoring, for the moment at least, support for education and training in some areas in order to make possible a strong reservoir of promising investigators for the future. The attainment of this objective with a relatively limited income, again, would force a reduction in funds available for the proven scientist (those who have), so that resources become available for the promising investigator (those who have not).

One might argue that the acceptance of such a program might threaten the good name of our Society. Although this might, indeed, prove to be a small risk, I think it is not as serious as the risk of disenchanting the promising investigator who will turn his attention to other problems because he finds a more receptive and sympathetic audience in other areas.

Another solution to this problem is to increase the funds available for support of research and medical education in the field of respiratory diseases and tuberculosis. It has been estimated that for a research program to maintain its quality, steadily rising support is needed, or else deterioration results. A conservative estimate is an increase of 10 per cent per year to meet this requirement. There has been some trend in this direction at the local level. There is no question that this is evidence of some understanding of the needs. On the other hand, there are many, too many, local tuberculosis associations that still do not comprehend the complete triad of service, research, and education.

The need for better understanding of these problems is acute and pressing. Every possible effort should be made by members of the National Tuberculosis Association and the American Thoracic Society to concern themselves with *all* of the factors which influence the future course of this voluntary health movement. The first step is an awareness of the needs. These are evident. We must now take the next step – reapportion Christmas Seal funds to meet these needs more realistically.

Martin M. Cummings, M.D., formerly Director of Research for the Veterans Administration is now Chairman and Professor, Department of Microbiology at the University of Oklahoma School of Medicine. His research interests have been in the field of tuberculosis and respiratory diseases. As Chairman of the ATS-NTA Committee on Research for the past two years, he has had an opportunity to become acquainted with the scientific and administrative problems that now face our organization.

RESEARCH Points the Way

Agnes Fahy

Science Writer, National Tuberculosis Association

FORTY GRANTS, totaling $282,825, to aid investigators engaged in research were approved for support by the Committee on Research of the American Thoracic Society, medical section of the National Tuberculosis Association, at its meeting in March. Only $220,000 is budgeted for grants, but as we go to press, enough in additional funds has been contributed or pledged by constituent and affiliated associations to assure support to all 40 investigators. Several other approved grants were deferred because of uncertainty as to total contributions which might be received.

The Committee on Research, previously called the Committee on Medical Research, now includes two social scientists, two representatives of the NTA Board of Directors, and a member of the National Conference of Tuberculosis Workers. The committee was enlarged as part of a general plan to combine medical and social research activities.

One of the 40 applications approved is in the field of social research; the others are in the clinical and biological sciences, dealing with various aspects of tuberculosis and other respiratory diseases.

The grant in the social sciences is to **Odin W. Anderson, Ph.D.,** of the Health Information Foundation, New York, N.Y., to explore existing data relating to health and social factors in general and tuberculosis and respiratory diseases in particular. This is conceived as a preliminary step before the outstanding needs for social research in tuberculosis and respiratory diseases can be defined.

Another application, which has been approved and which represents a departure from the usual procedure, is a "directed research" project. The grant supports an investigation of the feasibility of a new technique for administering the tuberculin test which might overcome some of the problems involved in large-scale testing. The study will be carried out at the **Armour Research Foundation-Illinois Institute of Technology, Chicago.**

The other approved grants include studies of the behavior of the tubercle bacillus and other mycobacteria under varying conditions and their effect on man.

Laboratory studies of mycobacteria have taken on added significance in recent years because of two developments. One is the availability and widespread use of chemotherapeutic agents in treating tuberculosis. The other is the discovery of mycobacteria resembling the tubercule bacillus, but not answering the classic description of that microorganism, which have been variously known as atypical and anonymous and are now called unclassified.

Microbes and Drugs

The use of drugs has given a new slant to basic research of a type that has long been supported by the NTA. There are, for example, the studies of **Hilda Pope Willett, Ph.D.,** associate professor of microbiology, **Duke University Medical Center, Durham, N.C.**

Dr. Willett has been observing the metabolism of the tubercle bacillus for years. Among the discoveries she has made is that the cell walls of the tubercle bacillus contain large quantities of an amino acid that is not found in animal tissue. How the bacillus uses this amino acid, called diaminopimelic acid, or DAP for short, may suggest how an important life-process of the bacillus can be blocked, for, as Dr. Willett has pointed out, the most effective way to fight a microorganism is to attack a vital spot in its metabolism without causing a toxic reaction in the host.

The amino acids of the cell wall of the tubercle bacillus are also engaging the attention of **Max S. Dunn, Ph.D.,** professor of chemistry, **University of California, Los Angeles,** who hopes to determine whether there are any differences in these chemical components in disease-producing strains of mycobacteria and nonpathogenic ones. In his detailed studies of the chemical make-up of the tubercle bacillus, Dr. Dunn is also paying particular attention to its fatty constituents and seeking to find out if virulent and nonvirulent strains have different metabolic processes.

Metabolic processes are the key to a test developed by **Kiyoshi Konno, M.D.,** of the **Tohoku University School of Medicine,** Kitayobancho, Sendai, **Japan,** who is the first investigator outside the United States to receive a grant.

Dr. Konno is the originator of the niacin test, a method of differentiating between tubercle bacilli and other mycobacteria by the production of niacin in the culture medium. The investigator has found that only human tubercle bacilli produce this nicotinic acid. He is devising a different test to classify other mycobacteria biochemically.

A study of the diverse characteristics of different mycobacteria is being undertaken by **Ernest H. Runyon, Ph.D.**, of the **Veterans Administration Hospital, Salt Lake City, Utah,** who is building up a culture bank of as many strains of unclassified mycobacteria as can be collected.

The culture bank of the tubercle bacilli maintained by **William Steenken, Jr., D.Sc.**, director of the **Trudeau Laboratory, Saranac Lake, N.Y.**, is being continued. The bank is supported as a service to investigators the world over and contains cultures of practically every known variety of tubercle bacilli. Last year Dr. Steenken distributed 269 cultures to investigators in the United States, Canada, Czechoslovakia, Germany, India, Indonesia, Ireland, Italy, Japan, Mexico, Scotland, the Union of South Africa, and Yugoslavia.

Drugs and the Host

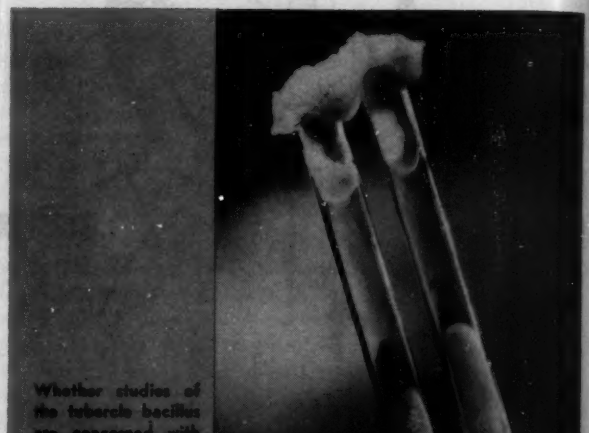
The peculiarities of the tubercle bacillus in its reaction to drugs are under scrutiny by **Walsh McDermott, M.D.**, and **Robert McCune, M.D.**, Livingston Farrand Professor and assistant professor, respectively, of Public Health and Preventive Medicine, **Cornell University Medical College, New York, N.Y.** They are delving into the problem in relation to the interplay between the microorganism and the animal body.

Drs. McDermott and McCune are investigating the phenomenon of "microbial persistence" in animals infected with tuberculosis that have been treated with drugs. "Persistence" is the term they use to describe those contrary microorganisms that remain in the body even though laboratory tests show they are still susceptible to the drugs in use and, by all rights, should have been knocked out.

A new test animal has, in effect, been developed by **Leon H. Schmidt, Ph.D.**, director of **The Christ Hospital Institute of Medical Research, Cincinnati, Ohio,** for his studies of drugs of present or potential usefulness in treating tuberculosis. The animal used is the rhesus monkey, but tuberculosis ordinarily is an acute, rapidly progressive disease in the monkey, and Dr. Schmidt needed an animal in which the disease took a form more closely resembling that in man. He has succeeded in producing a subacute form of the disease in the monkey and thus can evaluate drugs under conditions closely resembling those of man.

Specific aspects of drug treatment of patients are being studied by two other grantees.

M. Henry Williams, Jr., M.D., associate professor of medicine and physiology, Albert Einstein College of Medicine, New York, N.Y., received approval for a grant to study the physiological and clinical effects of steroid therapy in tuberculosis. Sponsorship of the project has since been taken over by the New York TB and Health Association.



Whether studies of the tubercle bacillus are concerned with chemical composition of the microorganism or the effect of drugs on the germ, it is necessary for the bacillus to be grown artificially in the laboratory. In the tube on the left, colonies of tubercle bacilli can be detected; the tube on the right contains a drug which has inhibited the growth of the bacilli.

Julia M. Jones, M.D., visiting physician, chest service, **Bellevue Hospital, New York, N.Y.**, is evaluating the long-term effects of drug treatment of extrapulmonary tuberculosis. Although the immediate response of the patient to treatment is usually known, there is little data on the late results of treatment of patients with tuberculosis of the lymph nodes, pelvic tuberculosis, pericarditis, and other forms of the disease not in the lung. Her study is expected to point the way to improve treatment of these forms of tuberculosis.

Bacteria and Viruses

The strange little virus-like particles that invade bacteria and may or may not be responsible for their virulence have the absorbed attention of three grantees. Bacteriophages, as they are known, are helpful in typing various strains of a species of microorganism, and also are throwing light on the life processes of the bacteria.

The effect of bacteriophages on the morphology of the tubercle bacillus is under investigation by **Seymour Froman, Ph.D.**, medical microbiologist, **Olive View Hospital, Olive View, Calif.** Dr. Froman is studying the cytology of phage infection in various acid-fast bacilli, and also how saprophytes and unclassified acid-fast bacilli grow and multiply.

A study of the nucleic acid and protein composition of two mycobacteriophages isolated at Olive View is underway by **Margaret I. Sellers, Ph.D.**, assistant professor, Department of Infectious Diseases, **University of California School of Medicine, Los Angeles.** The studies are expected to reveal the composition of the two phages, one of which attacks virulent mycobacteria and one which does not.

Arthur C. White, M.D., assistant professor of medicine, **University of Louisville Medical School, Louisville, Ky.,** plans to investigate effects of bacteriophage on the morphology, virulence, and biochemical properties of mycobacteria.

Resistance and Disease

Immunity in tuberculosis has so many unusual angles that it has long fascinated immunologists. In fact, studies of immunity in tuberculosis have been trail-blazers for studies of immunity in infectious diseases in general.

The classic studies of **Max B. Lurie, M.D.,** professor of experimental pathology, the **Henry Phipps Institute, University of Pennsylvania, Philadelphia,** have reached the stage where the cells primarily involved in nonspecific resistance can be identified. These are mononuclear phagocytes in certain body tissue. When the capacity of these cells to inhibit the multiplication of tubercle bacilli which they have ingested is enhanced, resistance to tuberculosis is increased, Dr. Lurie has found. He is now studying the physiological factors that influence the activity of the cells, particularly the role of the hormones. Dr. Lurie has already shown that the activity of the mononuclear phagocytes is increased in hyperthyroidism. With greater knowledge of the role of hormones in resistance and susceptibility, additional ways of controlling the disease should become apparent.

Several aspects of immunity and allergy are under study by **Sidney Raffel, M.D.,** professor, Department of Medical Microbiology, **Stanford University School of Medicine, Stanford, Calif.** Dr. Raffel and associates have isolated a factor from the blood of animals and human beings that has the ability to halt the progress of tuberculous infection. The factor is under study for its possible significance in immunity to tuberculosis. They are also studying the role of antibodies in tuberculosis immunity, which differs from that in other diseases.

Donald W. Smith, Ph.D., associate professor, Department of Medical Microbiology, **University of Wisconsin, Madison,** is studying fractions of killed tubercle bacilli for their ability to produce immunity in guinea pigs. The evaluation of these particles is expected to lead to an understanding of the nature of substances responsible for immunity in tuberculosis.

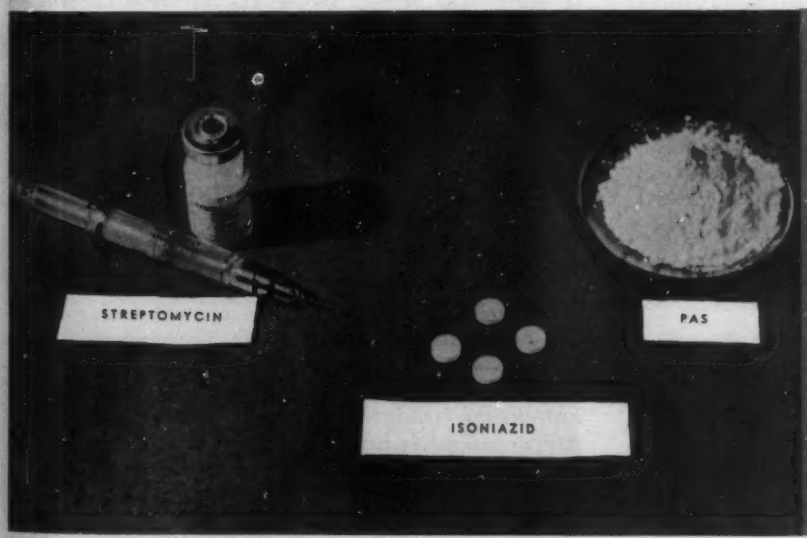
H. Stuart Willis, M.D., of the **North Carolina Sanatorium System, Chapel Hill, N.C.,** is making a comparative study of BCG, the vaccine made from a bovine strain of tubercle bacillus and the one most widely used against tuberculosis, and a vaccine made from a nonvirulent human strain, R_1.

The usefulness of the gel diffusion technique for testing the blood serum for antibodies to the tubercle bacillus is continuing to be evaluated under the grant to **Guy P. Youmans, M.D.,** professor of microbiology, of **Northwestern University Medical School, Chicago, Ill.** The test, developed by Dr. Youmans and Robert C. Parlett, M.D., while working under an NTA grant, has proved a sensitive index of recent or active infection in a large percentage of cases tested so far. The study will be extended during the year to test the technique for fungus diseases also.

The mechanism of resistance to fungus diseases will be studied by **Gilbert A. Hill, Ph.D.,** and **Stanley Marcus, Ph.D.,** of the **Latter Day Saints Hospital, Salt Lake City, Utah.** With mice as their laboratory animal, the investigators plan to find out what degree of immunity can be produced against histoplasmosis and coccidioidomycosis.

Antigens and Skin Tests

The tuberculin test, which has a variety of uses in the study and control of tuberculosis, is at the core of case-finding and epidemiologic studies. Similar substances used in skin sensitivity tests have been prepared, too, from unclassified mycobacteria.



Drugs have proved their value in the treatment of tuberculosis, but how they act to inhibit the tubercule bacillus and to aid the patient is not clearly understood. Thus, several studies are concerned with the mode of action of such drugs as streptomycin, isoniazid, and PAS.

Contributions to the Research Program from Constituent and Affiliated Associations

As we go to press, the following associations are supporting NTA-ATS research projects, thus making it possible to underwrite projects that otherwise would have been turned down for lack of funds.

Contributor	*Amount*	*Allocation*
CONNECTICUT		
Local associations fund	$2,200.00*	Dr. Kiyoshi Konno
Local associations fund	an unspecified sum	Armour Research Foundation
DELAWARE		
Delaware Anti-TB Society	3,000.00	Armour Research Foundation
HAWAII		
Maui County	25.00	To be allocated
INDIANA		
Indiana TB Association	an unspecified sum	To be allocated
Delaware County	5–7,000.00	To be allocated
IOWA		
Local associations fund	15,445.00	To be allocated
Local associations fund	1,000.00	Armour Research Foundation
KANSAS		
Local associations fund	2,934.25	Drs. G. A. Hill & S. Marcus
NEW JERSEY		
New Jersey Medical Research & Teaching Fund	7,306.00* an unspecified sum	Dr. Sidney Raffel Dr. Guy P. Youmans
NORTH DAKOTA		
Local associations fund	2,933.00*	Dr. H. Stuart Willis
Local associations fund	6,245.10	To be allocated
OHIO		
Montgomery County	500.00	Dr. Leon Schmidt
Ottawa County	250.00	Dr. Guy P. Youmans
OREGON		
Grant County	10.00	To be allocated
Lincoln County	50.00	To be allocated
Yamhill County	15.00	To be allocated
Douglas County	25.00	To be allocated
SOUTH DAKOTA		
Perkins County	35.00	Dr. Guy P. Youmans
Stanley County	50.00	To be allocated
TENNESSEE		
Davidson County	1,500.00	Dr. Arthur White
VIRGINIA		
Virginia TB Association	1,000.00	Armour Research Foundation
WASHINGTON		
Asotin County	100.00	Dr. Guy P. Youmans
Spokane County	1,000.00	Dr. Guy P. Youmans
WISCONSIN		
Wisconsin Local Associations	3,357.00*	Dr. Arthur Siebens
Research Fund	6,000.00*	Dr. Donald Smith

*Full support

CORRECTION: Dr. Howard Payne, who contributed the article, "TB Associations in a Time of Change," to the May issue, taught internal medicine and chest diseases at Howard University from 1932 to 1938, not at Harvard. However, he is at present instructor in medicine at Harvard Medical School.

Under the direction of **Florence E. MacInnis, M.D.**, medical director, **Heart of America Tuberculosis Association, Kansas City, Mo.**, a study is underway to evaluate the tuberculin test as a case-finding tool among school children of various age groups. Children in the eighth grade who were negative last year will be retested in the ninth grade to determine the conversion rate. These rates will be compared with rates already determined for kindergarten and the first grade.

A study of skin reactions among three racial groups—whites, Negros, and Indians—is being planned by **Martin M. Cummings, M.D.**, chairman and professor, Department of Microbiology, **University of Oklahoma School of Medicine, Oklahoma City.** Dr. Cummings wants to find out whether differences in skin reactions among the races are due to inherited immunologic factors. The passive transfer of tuberculin reactions will be attempted by Dr. Cummings; that is, he will see if reactions can be obtained in people injected with cells from individuals who react to tuberculin. Avian strains of tubercle bacilli and the Battey strain of unclassified mycobacteria will also be used in an effort to determine if there are specific antibodies to these strains.

The specificity of the tuberculin test is under study by **Lydia B. Edwards, M.D.**, of the Tuberculosis Program, **U.S. Public Health Service, Washington, D.C.** Under Dr. Edwards' supervision, approximately 50,000 persons have been tested with PPD preparations made from unclassified mycobacteria as well as the tubercle bacillus for a comparative study of the prevalence of the respective infections. During the year Dr. Edwards will direct her studies at sharpening the precision of the tuberculin test so that cross-reactions will not interfere with interpretation of reactions.

A countrywide tuberculin testing pilot study is in its fifth year in **Pamlico County, North Carolina,** with the aid of a grant to **David T. Smith, M.D.**, professor of epidemiology, **Duke University, Durham, N.C.** All county residents one year old and over are being tested and retested at intervals in an effort to determine the prevalence of tuberculous infection, conversion rates from negative to positive to tuberculin, and from positive to active disease. It is hoped, too, to find unknown cases of disease by following up adequately the families of all persons who convert from negative to a positive tuberculin test.

Machines and the Lung

Technologic advances have moved along with medical advances to provide the physician with tools to measure more precisely the after-effect of respiratory diseases on the lung and the circulatory system. Pulmonary function tests, made possible by the development of new instruments, enable the physiologist to gauge whether the patient can safely undergo surgery, whether he can live an active life when his disease is under control, or whether he will be a respiratory cripple. The largest number of grants falls in this category.

The extension and improvement of existing tables that serve as the norm for determining pulmonary function in children is contemplated by **I. Leonard Bernstein, M.D.,** director, Pulmonary Function Laboratory, **Cincinnati Convalescent Hospital for Children, Cincinnati.** Values for maximal breathing capacity, functional residual capacity, and vital capacity have already been established by Dr. Bernstein for children from 6 to 14 years of age. He now plans to extend them to cover children between the ages of 5 and 18.

Some of the problems that occur following lung surgery, particularly among the aged, will be investigated by **John Philip Bunker, M.D.,** assistant clinical professor of medicine, **Harvard Medical School, Boston, Mass.** Dr. Bunker's studies will be both experimental and clinical. He will produce in animals a condition known as atelectasis, in which partial collapse of the lung occurs and fluid accumulates. Through study of this condition in animals, he hopes to attain understanding of the various factors involved when the condition occurs in patients and how it can be prevented.

The physical properties of the lung and how they vary in diseased conditions are to be studied by **Robert A. Carton, M.D.,** attending physician, **Presbyterian-St. Luke's Hospital, Chicago, Ill.** Dr. Carton is interested in finding out what the role of elastic tissue in the lung is and how this elastic tissue is altered in disease, particularly in emphysema.

An attempt to produce emphysema in the guinea pig, the better to study the effects of this disease on the lung, will be made by **General Hospital, Boston.** The production of emphysema experimentally is expected to aid greatly the study of a disease which presents many puzzles to the doctor today.

Studies of the smallest blood vessels to determine what changes occur in illness are being continued by **John W. Irwin, M.D.,** director of the Microcirculatory Laboratory, **Massachusetts Eye and Ear Infirmary, Boston.** Dr. Irwin expects to improve his system of measuring blood pressure in order to obtain pressuregrams of the tiny arterioles and venules of the lung. In another phase of his study, he plans to use the rabbit ear chamber technique, by which the blood vessels in the long ear of the rabbit can be observed, in order to study changes occurring in the circulation due to pulmonary viral infections.

Skin testing is becoming more and more important in case finding and in epidemiologic studies. Efforts are being increased to find the infected before disease develops and to distinguish between infection with the tubercle bacillus and unclassified bacilli. The Mantoux technique, as shown below, can be used either with tuberculin or with PPD prepared from unclassified antigens.

The value of an operation to gain access to the trachea from the neck in patients with pulmonary insufficiency will be investigated by **C. Rollins Hanlon, M.D.,** professor of surgery, Department of Surgery, **St. Louis University School of Medicine, St. Louis, Mo.** Dr. Hanlon plans to study the physiology of the trachea and the action of the cilia, the little hairs that serve as a sort of cleaning brush to protect the bronchus from extraneous matter. The studies are expected to explain why patients are sometimes unable to evaucate secretions from the tracheobronchial tree following operations on the lung.

A reference file of pathologic specimens of the lung will be established as part of the studies of **Daniel E. Jenkins, M.D.,** professor of medicine, **Baylor University College of Medicine, Houston, Tex.** A recently developed technique for inflating, straining, and fixing the specimens so that sections can be studied in three dimensions and in the greatest detail will be used by Dr. Jenkins in correlating anatomical and pathological changes with clinical, roentgenographic, and physiological findings in lung disease.

The collateral pulmonary circulation, which takes over in certain disease conditions when the primary circulation is impaired, will be under study by **James B. Littlefield, M.D.,** assistant professor of surgery, **University of Virginia School of Medicine, Charlottesville, Va.** Dr. Littlefield hopes to gain a better understanding than now exists of how the collateral system is stimulated to expand and what physiological changes occur when it does.

Forces responsible for variations in the ventilation of different areas of the lung will be investigated by **Carroll J. Martin, M.D.,** chief of the cardiopulmonary laboratory, **Firland Sanatorium, Seattle, Wash.** Variations in ventilation in the lobes of the lung is a feature of emphysema. Dr. Martin will seek to determine the effect of air flow on the filling and emptying patterns of the lung. He will also continue his efforts to determine the incidence of obstructive emphysema among routine admissions to the tuberculosis hospital.

Oscar K. Reiss, Ph.D., a biochemist at the **University of Colorado School of Medicine, Denver,** plans to apply his knowledge of chemical reactions to make a "metabolic outline" of changes occurring in lung tissue in producing the energy needed for normal functioning. Knowledge gained of the metabolism of the lung, he believes, may aid in planning the drug therapy of certain pulmonary diseases.

Searching for the answer to a stimulating question, **Arthur A. Siebens, M.D.,** director of the respiratory and rehabilitation center, **University of Wisconsin School of Medicine, Madison,** is planning experimental work to find out if lung tissue is capable of regeneration early in life. The answer will enable surgeons to gain a better understanding than is now possible of the outlook for children who must undergo surgery for the removal of part of a lung, and will also suggest the best time in the child's life for resection to be performed.

A comparative study of the flow of blood, and also of the blood volume, in the capillaries in different areas of the lung will be continued by **William S. Spicer, Jr., M.D.,** chief of the section for pulmonary diseases, **University of Maryland School of Medicine, Baltimore.** By measuring capillary flow and volume, Dr. Spicer believes that an estimate could be made of capillary resistance that would aid in understanding the effect of disease on various areas of the lung and that, in combination with the catheter which can be used to explore the ventricles and pulmonary arteries, could be used to study changes simultaneously throughout the lesser circulation.

The air conditioning system of the respiratory tract will be under investigation by **Roe E. Wells, Jr., M.D.,** associate in medicine, **Harvard Medical School, Boston.** Dr. Wells expects to determine the influence of diseases of the respiratory tract on the heating and humidification processes of the upper respiratory tract. He believes that the water content of viscous secretions, and thus its thickness, may be seriously altered by abnormal hydration, possibly as a breakdown of the airconditioning system. Dr. Wells hopes to determine whether this occurs, and if so, why it does.

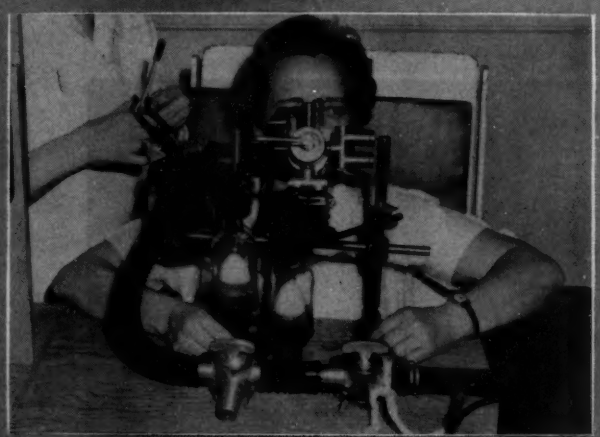
Non-TB Infections and the Lung

Three grants are for studies in relation to infections of the lung that are not of tuberculous origin.

The mechanism of the production of fever in non-tuberculous infections of the lung is under study by **Abraham I. Braude, M.D.,** professor of medicine, **University of Pittsburgh School of Medicine, Pittsburgh, Pa.** Dr. Braude is seeking to determine how fever is produced in bacterial and fungus infections, and whether this is due to the presence of pyrogens in pulmonary disease-producing agents; to the release of an antigen that becomes pyrogenic after hypersensitivity has been induced by the pathogen; or to the reaction between the infecting agent and the tissues of the host.

The epidemiology of sarcoidosis, a lung disease sometimes confused with tuberculosis, will be under study by **Harold L. Israel, M.D.,** clinical professor of medicine, **Jefferson Medical College, Philadelphia.** Patients registered at the sarcoid clinic of Jefferson College will be used in the study, which will also encompass the effects of treatment with paraminobenzoic acid salts.

Correlation of clinical, physiologic, and pathologic observations in pulmonary emphysema is being undertaken by **Roger S. Mitchell, M.D.,** director, **Colorado Foundation for Research in Tuberculosis, Denver.** The basis of the study will be an investigation of morphologic changes in the lungs of patients who have had intensive clinical and physiologic study before death or biopsy.



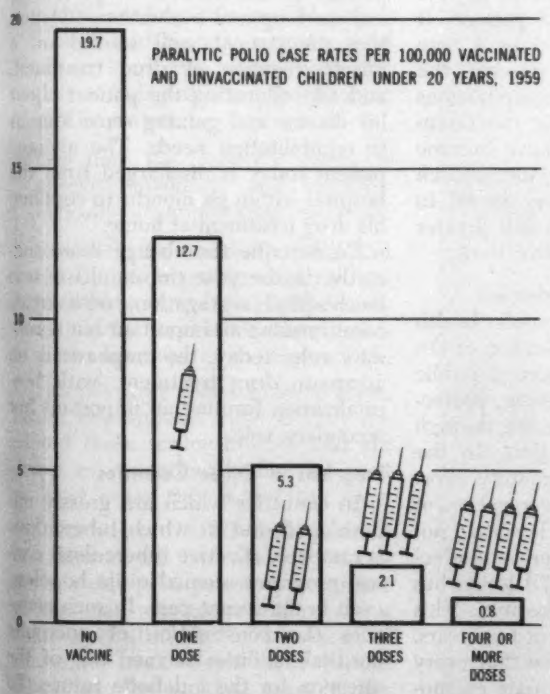
The lung is a complicated human machine, but man has succeeded in inventing machinery to aid him in studying the numerous factors involved in supplying the body with oxygen. Tests to determine the functioning of the lung under varying conditions of health and disease are being used by a number of the NTA-ATS investigators.

TB Associations Urged to Get Behind Polio Protection Push

DEADLY PARALYTIC POLIO cases have been rising for the past two years. Last year, the cases zoomed to 54 per cent over 1958. The Salk vaccine has been proved safe and effective in preventing paralytic polio. The first two years after it was introduced, the number of cases fell off spectacularly. Why the change? What's gone wrong?

Dr. James E. Perkins, president of the National Health Council, has asked all voluntary health agencies all over the country: *Please get behind this year's campaign to get everybody completely immunized and do everything you can to help.* NTA urges each TB association to get in touch with local health authorities and ask what it can do to give its full strength to the effort.

HOW VACCINATION CUTS POLIO PARALYSIS



COMPUTED BY THE NATIONAL FOUNDATION FROM U. S. PUBLIC HEALTH SERVICE DATA.

Though most of those not fully protected from paralytic polio are adults, 8,500,000 are children under five. Whether adults bother to get vaccinated is perhaps their own business. They can decide for themselves. But the children can't. Somehow, they must be protected against the crippling, pain, and death which can be avoided. Here Dr. Salk gives a little girl that vital shot.

When the Salk vaccine was first released five years ago, there wasn't much available, not nearly enough to go around. All over the country, people rushed to get immunized before the supply ran out. As a result, paralytic polio cases nosedived sensationally. Then apathy set in. Right now, 60 per cent of our population is not properly protected against polio, though there's more than enough vaccine for everybody.

Two Red-Letter Questions:

James E. Perkins, M.D.
Managing Director, NTA

In the light of the Arden House recommendations, what is the role of health departments in TB control and where can local associations assist?

Do we still believe in the unfettered right of citizens to band together to try to solve a health problem important to them?

SEVERAL IMPORTANT TRENDS and basic issues are currently facing the National Tuberculosis Association, its affiliates, and national voluntary health agencies as a whole.

Tuberculosis Control

The most significant trend with regard to tuberculosis control is the changing emphasis toward the use of drug treatment as a public health measure. This is the basic element behind the major recommendation of the Arden House Conference. It is the underlying reason the NTA had the courage to propose to the International Union Against Tuberculosis at its conference in Istanbul, Turkey, last September, that world-wide eradication of tuberculosis was no longer a foolish dream, and urged it to use its influence in turn to get the World Health Organization to add this to its other two top priority projects for eradication of malaria and smallpox. It is the precipitating reason for the complete revamping of the TB Control Program of the World Health Organization by an advisory committee of experts from eight countries which met in Geneva last fall.

This new and bold extension of drug treatment stems from the pleasant observation of accumulating scientific evidence that the basic drug, isoniazid, is even a better anti-tuberculosis drug than was originally anticipated. It is so safe compared with most other drugs, so lacking in undesirable side effects, so effective in the usual case if given properly over a sufficient period of time, and so easily administered (by mouth) that it is suitable for mass application as a public health measure for the benefit of the community as well as for the benefit of the individual patient. It can and should be used as a true prophylactic agent to prevent the development of serious complications in young children whose tuberculin skin test indicates they have become infected. And very important research currently in progress *may* reveal in a few years reasons for still greater application on a preventive basis.

Drugs as a Public Health Measure

What is meant by "a public health measure"? Using a modification of Dr. Ira V. Hiscock's definition, a public health measure is promotion, protection, or restoration of health *through organized community effort*. In the past, our organized community effort has been centered on segregation of the TB patient in the hospital, not only until he has become non-infectious but also until his TB lesion has become as stable as possible. This usually took a minimum of two years.

The new focus is to see that every TB patient receives adequate chemotherapy, which in most instances will mean over a period of two years, but with most of this treatment taking place while the patient is home after a brief period of hospitalization.

Hospitalization today is primarily for the purpose of (1) protecting the public until a negative sputum status has been achieved, (2) giving the patient the benefit of a complete clinical work-up and evaluation, (3) getting the patient well started on a proper regimen of drug treatment, and (4) educating the patient about his disease and gaining some idea as to rehabilitation needs. The average patient today is discharged from the hospital within six months to continue his drug treatment at home.

To describe the change more succintly, in the past the emphasis was on hospital segregation, with treatment forming an important but secondary role; today, the emphasis is on adequate *drug* treatment, with hospitalization forming an important but secondary role.

Programs in Other Countries

In countries which are grossly undeveloped and in which tuberculosis is rampant, effective tuberculosis control programs seemed quite hopeless, even in the recent past. In such countries the construction of adequate hospital facilities seemed out of the question for the indefinite future. To be sure, BCG vaccination was being

applied extensively, and no doubt was of some help. But since this measure was necessarily confined to the small percentage of the population not yet infected—mostly young children—it was going to take some years before any effect would be shown.

With the new drug therapy, however, a new hope has been born in these countries through mass application of such treatment on an ambulatory basis, in spite of the definite handicap of lack of hospital facilities for initial hospitalization of patients.

Role of the Health Department

Getting back to the United States, what does this change in emphasis mean for the official health agency and the voluntary tuberculosis association? Taking the health department first, it must assume a responsibility today which it has not often had to assume in the past, when the patient usually underwent his total period of treatment in the hospital.

In addition to the other usual TB control activities of the past, the health department now must:

1. See that the patient completes his course of drug therapy, which, as I have said, usually means a total of at least two years—with the patient living at home during most of this period.
2. See that the patient's status is checked medically and bacteriologically at appropriate intervals;
3. See that the socio-economic and rehabilitation problems of the patient are met, enlisting and coordinating the services of other appropriate agencies in the community.

This is a large order! In some areas, health departments have already accepted these responsibilities and are doing an exceptionally fine job, but in most areas this is not the case.

According to USPHS studies, about one-third of the patients will be under the care of a private practitioner of medicine who often will not be a chest specialist. In such cases, of course, the health department will not take over the medical care of the patient, but it will have the responsi-

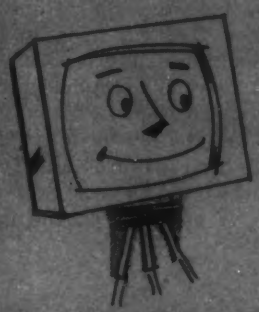
"No One is Safe 'Till All are Safe"

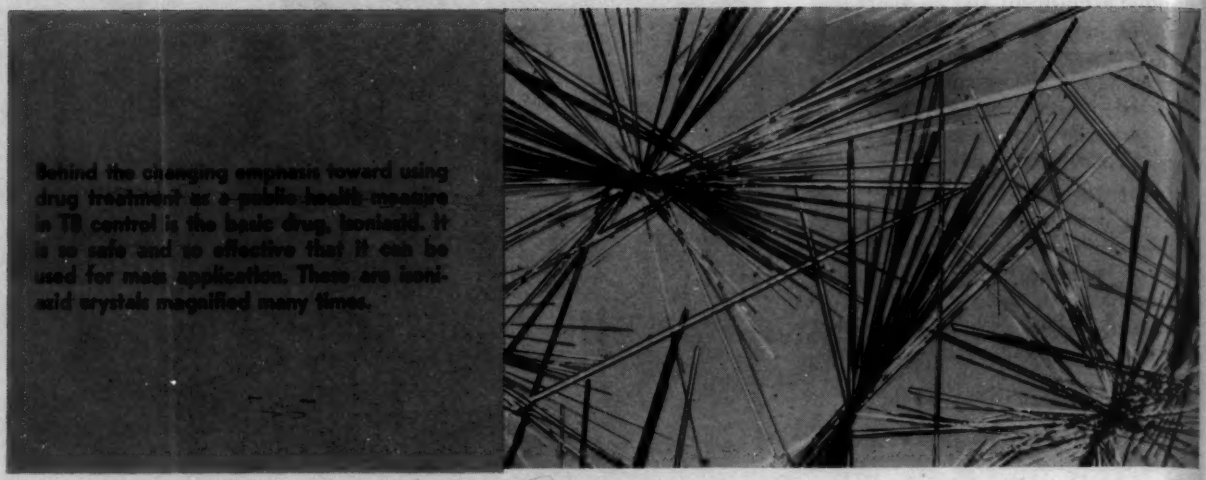
THAT WAS MRS. ELEANOR ROOSEVELT'S dramatic warning when she appeared on the ABC network's half-hour "Project: Tomorrow!" radio program, on May 22, that dealt with the fight to control tuberculosis.

"Project: Tomorrow!" a public service series of the ABC radio network, is run in association with the Council of National Organizations of the Adult Education Association. Each organization—NTA is one—"sponsors" a program in the series. This year's program on tuberculosis control, which featured Mrs. Roosevelt, also carried messages from, among others, Dr. James E. Perkins, Managing Director of the National Tuberculosis Association; Dr. Walsh McDermott, editor of the American Review of Respiratory Diseases; and Dr. Edith Lincoln, 1959 winner of the Trudeau Medal for outstanding scientific contribution to TB control.

Mrs. Roosevelt pointed out that even in the U.S., where the fight against TB has come a long way, tuberculosis strikes a new victim every 7 minutes. In other parts of the world, such as Asia, Africa, the Middle East and India, the number of known infectious cases is increasing. There are two and a half million active cases of TB in India alone.

"As our world grows smaller," Mrs. Roosevelt said, "with travel today between even the most distant points only a matter of hours . . . since tuberculosis is a contagious disease . . . no one is safe until all are safe."





Behind the changing emphasis toward using drug treatment as a public health measure in TB control is the basic drug, isoniazid. It is so safe and so effective that it can be used for mass application. These are isoniazid crystals magnified many times.

bility of ascertaining at intervals whether or not the patient is continuing to keep himself under his physician's supervision. If he is not, the health department will have to take steps to locate him and to again get him under medical supervision and drug treatment.

I see a number of deficiencies which will retard or block such a program at the present time in many counties in this country. Some of them are:

1. No local health department may exist in the community to carry on these functions.
2. The local health department may not have an adequate tuberculosis case register or sufficient staff—especially public health nurses—to follow-up adequately TB patients and their contacts.
3. Clinics may be inadequate. They may be too few in number, poorly and unattractively housed, understaffed, inaccessible to the patient's home, not open when the patient can attend, lacking in adequate X-ray and laboratory facilities, and lacking in those services and coordination with other agencies in the community which can assist the patient in his rehabilitation and socio-economic problems – including the purchase of drugs when the patient cannot afford them through his own resources.

Suggestions for Health Officers

If the health officer budgets his time and funds according to his most fundamental responsibility (control of communicable diseases) and the availability to him of practical control measures, he will not diminish his attention to the tuberculosis problem. He will attempt to keep appropriations at least at their current level, shifting his program and funds to meet the changing emphasis in TB control. Any money saved from hospitalization of the tuberculous, for example, should be transferred to budgets enabling the health department to see that all TB patients receive adequate drug therapy. This means educating the general practitioners; making available to them expert consultation; establishing and maintaining adequate out-patient clinics for the more than two-thirds of the patients who will not be under the care of a private physician; training and employing enough public health nurses; setting up some formal and working relationship with the welfare department and other agencies that can help in the patient's socio-economic problems; and establishing and keeping up-to-date a TB case register. In many of these functions the health department is going to need help from the TB association, which I shall come to in a moment.

It probably is true that a health department can pursue a laissez faire policy, and unless some catastrophic affair occurs, TB will continue to decrease slowly, and perhaps even ultimately die out. But if this is the policy pursued, the conclusion seems to me inevitable that many of those who become ill with or die from tuberculosis in this period will do so needlessly. They will become ill or die because the health department failed to assume to the fullest its most fundamental responsibility of applying to the greatest extent possible currently available measures to control a communicable disease.

Role of the Tuberculosis Association

Now, where does the voluntary TB association fit in? All of these very difficult problems of the official health department are a pressing challenge to the TB association. Obviously, the first question is whether or not there exists adequate official community health services. If not, promotion of the needed services should receive top priority. If they exist but are deficient in one respect or another, the TB association should try to be helpful in getting the deficiencies corrected, and in maintaining properly functioning services until TB has been eliminated. The TB association is usually in a much better position to encourage adequate financing for the health department than the health department

itself, but even it will be unsuccessful if the health department has not formulated an imaginative but sound and detailed plan for the wise expenditure of such tax funds. Close cooperative relationships and joint planning are essential between the health department and the TB association.

The Arden House Conference itself is a tangible example of the product of the close liaison between the USPHS and the NTA.

I wonder if local TB associations cannot be even more useful in this current situation. With the present and probably perennial shortage of health department staff, especially public health nurses, one sees a possible opportunity for the use of volunteers from TB associations—an aspect which received some attention this spring at the meeting of the USPHS's TB Advisory Committee. Why cannot carefully selected volunteers from the TB Association each have a panel of TB families to take under their wing, reminding them of appointments for examinations, and perhaps even assisting in transportation to the clinics if needed? Why can't volunteers assist in the time-consuming but interesting and important detective work of locating a patient who has disappeared from supervision before completing his regimen of drug therapy? Why can't they perform many of the reception, clinical, and agency-referring tasks in the clinics themselves?—And if they are married Registered Nurses who can spare some time from their families, why can't they perform even more professional services to supplement the activities of the regular, full-time professional health department staff?

Cooperation Among National Voluntary Health Agencies

The last trend I wish to mention is in relation to the national voluntary health agencies as a whole. This is the increasing spirit of cooperation among them in defining and discussing major health issues facing the nation, engaging in mutual assistance programs, and joining forces in supporting common projects of value to themselves and to the public. This trend is manifesting itself principally through the National Health Council. Examples of these three types of endeavor are the Council's annual health forums on major health issues; the assistance given by the other members of the council to the National Foundation and the USPHS in the polio immunization program; and the Health Careers program designed to interest young people in a career in the health field.

I think the NTA can be rather proud of the role it has played in the National Health Council. The first executive of the NTA, Dr. Livingston Farrand, was primarily responsible for the establishment of the NHC in 1920, and served as its first president. When the Council went into hibernation because of the depression of the '30's and World War II, it was the NTA which took the leadership among the voluntary health agencies in its revival in 1948. When difficulties beset it in 1953, at the time the special Rockefeller Foundation support expired, it was the NTA again which bore the brunt of preventing dissolution, and helping to reorganize it until it now is at the peak of its history in membership, financial status, and national influence.

The National Health Council, among many other things, is a very good answer to criticism of remaining independent in fund raising. Although NHC has a strict policy that it is not concerned with the manner in which its member agencies raise their funds (beyond meeting certain standards of accounting and ethics), it does unite the agencies in a joint endeavor to better meet the total health needs of all of the citizens of the United States.

The Principal Issue Ahead

What is the principal issue facing them today? This question was put to me recently by two writers preparing articles on voluntary health agencies for national magazines.

My reply was the following: "To what extent in these United States of America today should it be the policy that any group of citizens may have the right to band themselves together to try to do something about a health problem which is important to them?"

Personally, I think this right, which has been enjoyed by Americans since the country was founded, should be curtailed or eliminated only if efficiency is more important than freedom; if U.S. citizens should be spared the bother of making their own personal decisions; if competition is an evil which should be eliminated; and if ultimately it is preferable to have everything in the health field performed by the federal government through tax funds.

If the answer, however, is that this right should continue in full force, this almost automatically answers the question of compelling every voluntary health agency into a united fund.

The newer voluntary health agencies, such as the National Council on Alcoholism, state that if they had been forced to become established only within the framework of a united fund, they would have died a-borning! And those of us in most of the older agencies know from actual experience that if we are forced into united funds, our programs will have to be drastically cut, to the detriment of the public, and contrary, we believe, to its wishes.

So I conclude by repeating this fundamental question facing us today —and I include in the "us" labor, management, government and John Q. Public—"Do we still believe that in the United States of America any group of citizens has a right to organize itself into a voluntary association to attempt to do something about a health problem which is of great concern personally to its members?" When and if the answer to this question becomes "No!" I think it will be a sad day for America. I hope it will continue to be "Yes!"

PICTURE CREDITS

Cover—Ciba Pharmaceutical Products, Inc.

Pg. 3—Abbott Laboratories (top) Nat. Inst. of Health (bottom)

Pg. 6—Hoffman-LaRoche

Pg. 7—E. R. Squibb and Sons

Pg. 11—The National Foundation

We wish to thank "American Druggist" for supplying us with the cover photo, as well as pictures on Pp. 3, 6, 7, and 14.

NTA Warns on Effect of CIGARETTE SMOKING

Lung cancer is now one of the most common and most deadly of all forms of human cancer. The death rate today is ten times what it was thirty years ago. There are roughly 35,000 new cases of lung cancer a year, and over 90 percent of these patients die of the disease.

Scientists have engaged in a great deal of research to uncover the reason for the tremendous increase in lung cancer deaths. To the great majority

of disinterested scientists, the evidence seems overwhelming that excessive cigarette smoking is a major factor in the increase in the prevalence of lung cancer, and probably also a factor in certain other chronic respiratory diseases on the ascendancy.

Therefore the NTA Board of Directors issued the following warning as a policy statement at its February 27, 1960 meeting:

"The National Tuberculosis Association warns all persons that:

—There is an alarming increase in deaths from lung cancer.

—Cigarette smoking is a major cause of lung cancer.

—The risk of lung cancer increases with the number of cigarettes smoked.

"Giving up smoking reduces the risk of lung cancer.

"Recent studies show that cigarette smoking is a factor in such crippling lung diseases as chronic bronchitis and emphysema.

"There is no single cause of all lung cancers. Breathing polluted city air may also add to the risk of lung cancer.

"No present method of treating tobacco or filtering the smoke has been proved to reduce the harmful effects of cigarette smoking; up to now, these harmful effects can be avoided only by *not* smoking cigarettes.

"All persons should be given these facts. Parents, teachers, and physicians have a special opportunity and a duty to warn our youth of these facts before the cigarette smoking habit has become established."

• • •

Dr. Alton Ochsner of New Orleans, discussing link between cigarettes and lung cancer: "If there was one-tenth the evidence that Brooklyn Bridge was unsafe for traffic it would be closed in 24 hours." —AMA News

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Dr. J. Burns Amberson, a pa president of the NTA and genera director of the New York TB an Health Association, has been name a master of the American College o Physicians. In 1952, Dr. Amberson who lives in Hillsdale, N.J., wa awarded the Trudeau Medal.

Mrs. Clotilde Sanguinet, recipie of the Indiana TB Association Auerbach Memorial Award in 195 was recently named recipient of th 1959 Indiana Public Health Associa tion award for outstanding service i the field of public health. Mrs. San guinet, who actively participated i the formation of the IPHA, is a mem ber of its Board of Directors.

Sadie Orr Dunbar, one of th great humanitarians of her generation and past president, vice-president and secretary-treasurer of the NCTW died on May 12, at the age of 79. Mrs Dunbar was executive secretary of the Oregon Association for the Prevention of TB from 1915 to 1951, and later served as consultant to the Board of Directors.

J. Dean Halliday, recently retired Executive Secretary of the Anti-TB League of Cleveland and Cuyahoga County, died on April 15 at the age of 70 following a brief illness. Mr. Halliday served as chief of the Cleveland Division of Health, and publicity director of NTA.

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